Response to OA of June 8, 2005
Ser. No. 10/723,446

IN THE CLAIMS

Claim History Summary:

Claims 1-21 were originally filed.

In an Office Action mailed June 8, 2005, the Office rejected claims 1-21, objected to claims 19, 20, 15 and 17, and rejected claim 9 under 35 USC §112, ¶2 as being indefinite.

Summary of Response

Claims 1, 6, 9, 15, and 17 are currently amended.

Claims 5 and 11 are canceled.

Claims 1-4, 6-10 and 12-21 are pending.

Detailed Listing of All Claims 1-21:

1 (Currently amended). A compressor wheel comprising:

titanium;

a lower, proximate end;

an upper, distal end;

an axis of rotation;

a z-plane positioned between the lower, proximate end and the upper, distal end wherein the z-plane coincides substantially with a lowermost point of a trailing edge of a blade of the compressor wheel; and

a joint having an axis coincident with the axis of rotation and an end surface positioned between the z-plane and the upper, distal end wherein, in axial cross-section, the end surface comprises an elliptical shape.

2 (Original). The compressor wheel of claim 1 wherein the joint is capable of receiving a balancing spindle and wherein a distal end of the balancing spindle extends beyond the z-plane.

3 (Original). The compressor wheel of claim 1 further comprising a balancing spindle positioned in the joint and having a distal end that extends beyond the z-plane.

4 (Original). The compressor wheel of claim 1 comprising a turbocharger compressor wheel.

5 (Canceled).

6 (Currently amended). The compressor wheel of claim ~~5~~ 1 wherein the ~~ellipse~~ elliptical shape comprises a radius to height ratio of approximately 3:1.

7 (Original). The compressor wheel of claim 1 wherein the compressor wheel comprises titanium alloy.

8 (Original). The compressor wheel of claim 1 wherein the joint comprises a proximate portion, an intermediate portion and a distal portion.

9 (Currently amended). The compressor wheel of claim 8 wherein the distal portion comprises a diameter and a length of approximately 1.6 times ~~of~~ the diameters.

10 (Original). The compressor wheel of claim 1 wherein the peak principle operational stress of the compressor wheel occurs proximate to the end surface and proximate to the axis of rotation and does not exceed the yield stress.

11 (Canceled).

12 (Original). The compressor wheel of claim 1 wherein the joint is capable of receiving a compressor shaft and wherein a distal end of the compressor shaft does not extend beyond the z-plane.

13 (Original). The compressor wheel of claim 1 further comprising a compressor shaft positioned in the joint and having a distal end that does not extend beyond the z-plane.

14 (Original). The compressor wheel of claim 13 wherein the compressor shaft comprises a turbocharger shaft.

15 (Currently amended). An assembly comprising:

a compressor wheel, the compressor wheel comprising titanium, a lower, proximate end, an upper, distal end, an axis of rotation, a z-plane positioned between the lower, proximate end and the upper, distal end wherein the z-plane coincides substantially with a lowermost point of a trailing edge of a blade of the compressor wheel, and a joint having an axis coincident with the axis of rotation and an end surface positioned between the z-plane and the upper, distal end wherein, in axial cross-section, the end surface comprises an elliptical shape or a full radius; and

a balancing spindle positioned in the joint and having a distal end that extends beyond the z-plane.

16 (Original). The assembly of claim 15 wherein the compressor wheel comprises titanium alloy.

17 (Currently amended). An assembly comprising:

a compressor wheel, the compressor wheel comprising titanium, a lower, proximate end, an upper, distal end, an axis of rotation, a z-plane positioned between the lower, proximate end and the upper, distal end wherein the z-plane coincides substantially with a lowermost point of a trailing edge of a blade of the compressor wheel, and a joint having an axis coincident with the axis of rotation and an end surface positioned between the z-plane and the upper, distal end wherein the end surface is shaped to reduce stress; and

a compressor shaft positioned in the joint and having a distal end that does not extend beyond the z-plane.

18 (Original). The assembly of claim 17 wherein the compressor wheel comprises titanium alloy.

19 (Original). A turbocharger comprising:

an end opposite the distal end of the compressor shaft of the assembly of claim 17 positioned in a turbine joint of a turbine wheel.

20 (Original). A method comprising:

inserting a balancing spindle into a closed-end joint of a compressor wheel to a depth beyond the z-plane of the compressor wheel;

balancing the compressor wheel;

removing the balancing spindle; and

inserting a compressor shaft into the closed-end joint of the compressor wheel to a depth that is not beyond the z-plane of the compressor wheel.

21 (Original). The method of claim 20 wherein the step of inserting the balancing spindle to the depth beyond the z-plane includes stabilizing the compressor wheel for the balancing.